FIELD SAMPLING PLAN
FOR THE
VALLEY PIKE VOC SITE
RIVERSIDE, MONTGOMERY COUNTY, OHIO

Prepared for
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region V

Prepared by
WESTON SOLUTIONS, INC.
Region V Superfund Technical Assessment and Response Team

July 8, 2013

Approved by: _____ Date: _____

Steve Renninger
EPA Region V
On-Scene Coordinator

Project Dates of Sampling:	July 2013
CERCLA Site/Spill Identifier No.:	C5U2
Contractor Organization:	Weston Solutions, Inc.
Contract Name:	START III
Contract No.:	EP-S5-06-04
Technical Direction Document No.:	S05-0001-1305-005
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ACRONYM LIST

ATSDR	Agency for Toxic Substances and Disease Registry
bgs	Below Ground Surface
CFR	Code of Federal Regulations
COC	Chain of Custody
EPA	United States Environmental Protection Agency
MS/MSD	Matrix Spike/ Matrix Spike Duplicate
OSC	On-Scene Coordinator
PPE	Personal Protective Equipment
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
FSP	Field Sampling Plan
MCL	Maximum Contaminant Level
MRP	Mullins Rubber Products, Inc.
ODH	Ohio Department of Health
Ohio EPA	Ohio Environmental Protection Agency
PCE	Tetrachloroethylene
PPE	Personal Protective Equipment
RAPCA	Regional Air Pollution Control Agency
SIFU	Site Investigation Field Unit
SOP	Standard Operating Procedure
START	Superfund Technical Assessment and Response Team
TCE	Trichloroethylene
VOC	Volatile Organic Compound
WESTON	Weston Solutions, Inc.

TABLE OF CONTENTS

Section **Page**

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

1.0 Introduction

This Field sampling plan (FSP) identifies the data collection activities and associated quality assurance/quality control (QA/QC) measures specific to the Valley Pike VOC (the Site) located in Riverside, Montgomery County, Ohio. All data will be generated in accordance with the quality requirements described in the Weston Solutions, Inc. (WESTON®) *Superfund Technical Assessment and Response Team (START) III Generic Quality Assurance Project Plan (QAPP)*, dated June 2006. The purpose of this FSP is to describe site-specific tasks that will be performed in support of the stated objectives. The FSP will reference the QAPP for generic tasks common to all data collection activities including routine procedures for sampling and analysis, sample documentation, equipment decontamination, sample handling, data management, assessment, and data review. Additional site-specific procedures and/or modifications to procedures described in the *START III Generic QAPP* are described in the following FSP elements.

This FSP is prepared, reviewed, and approved in accordance with the procedures detailed in the *START III Generic QAPP*. Any deviations or modifications to the approved FSP will be documented using **Table 1: FSP Revision Form.**

2.0 Project Management, FSP Distribution, and Project Team Member List

Management of the Site will be as documented in the *START III Generic QAPP*. Refer to the *START III Generic QAPP* for an organizational chart, communication pathways, personnel responsibilities and qualifications, and special personnel training requirements.

The following personnel will be involved in planning and/or technical activities performed for this data collection activity. Each will receive a copy of the approved FSP. A copy of the FSP will also be retained in the site file.

Personnel	Title	Organization	Phone No.	Email
Steve Renninger	OSC	EPA	513-260-7849	renninger.steven@epa.gov
John Sherrard	Project Manager/Site Leader	START	513-703-3092	jsherrard@css-dynamac.com
Dave Robinson	Health and Safety	START	937-572-3630	david.robinson@westonsolutions.com
Lisa Graczyk	QA Reviewer	START	312-305-6745	lgraczyk@dynamac.com
Greg Roussos	Project Scientist	START	513-604-4797	gregory.roussos@westonsolutions.com

NOTES:
OSC – On-Scene Coordinator
START – Superfund Technical Assessment and Response Team
QA – Quality Assurance

3.0 Planning and Problem Definition

3.1 Problem Definition

The purpose of this investigation is to collect groundwater, soil gas, sub-slab and/or indoor air samples to determine if vapor intrusion is occurring in a residential neighborhood of Riverside, Ohio.

3.2 Site History and Background

The Site is located at 2949 Valley Street, Riverside, Ohio (**Figure 1**). The geographical coordinates for the site are 39° 47' 51.25" North latitude and 84° 07' 55.63" West longitude. The Site is located in a mixed residential, commercial and industrial area. Mullins Rubber Products, Inc. (MRP) is the current operator on site and is currently molding heavy-duty truck trailer suspension bushings, but in the past had focused on retreading used tires. After an anonymous source reported MRP was under-reporting the amount of solvent used, the Ohio Environmental Protection Agency (Ohio EPA) and the Regional Air Pollution Control Agency (RAPCA) performed an inspection on May 14, 2001. It was determined that MRP falsely reported solvent usage and kept false records from 1995 to 2000. Criminal charges were filed in 2004 and the president of MRP pled guilty. MRP now operates under a Clean Air Act Title V operating permit with trichloroethylene (TCE) usage limited to a facility-wide rolling 12 month limit of 15.54 tons.

On May 9, 2013, the Ohio EPA requested assistance from EPA Region V to evaluate a residential neighborhood west of MRP for vapor intrusion.

3.3 Contaminants of Concern/Target Analytes

The contaminants of concern at the Site are volatile organic compounds (VOCs). The primary VOCs of concern are tetrachloroethylene (PCE) and TCE. Analyses for VOCs will be used to determine the exact nature of site contamination. EPA has requested the following analytical tests be performed from samples collected at the Site:

- EPA Method TO-15 for VOCs (soil gas, sub-slab and indoor air)
- EPA Method 8260B for VOCs (groundwater)

4.0 Project Description and Schedule

The site assessment will consist of tasks necessary to document and characterize threats posed to human health and the environment at the Site. Specifically the following tasks will be performed:

- Site reconnaissance, including documenting site conditions, identifying sampling locations, and conducting air monitoring.
- Oversight of Ohio EPA Geoprobe work. Ohio EPA Geoprobe work will include collecting groundwater samples and installing nested soil gas probes at 10 locations. Nested soil gas probes will be installed at shallow depths of about 10 to 11 feet below ground surface (bgs) and deep depths of 20 to 23 feet bgs.
- Installing up to ten sub-slab air samples from residential properties located in the neighborhood west of MPR. Additional sub-slab probes may be installed and sampled at residential and/or non-residential properties if the initial sample results show a potential for vapor intrusion.
- If necessary, collect indoor air samples from residential and/or non-residential properties
- Submitting three to five Ohio EPA-collected groundwater samples to a commercial laboratory for analysis.
- Collect up to 9 soil gas samples from soil gas probes installed by Ohio EPA.

The sampling design is provided below in Section 6.0.

Two commercial laboratories will be utilized for analytical services. WESTON START will provide sample coordination including laboratory procurement and sample shipment. Sample labels and chain-of-custody (COC) paperwork will be generated by WESTON START. Samples will be packaged properly and shipped by courier, or transported directly to the laboratory. The turn-around time for the sample data will be 5 business days. The sample results will be reviewed and validated by a WESTON START chemist within 2 weeks of data receipt from the laboratory. A summary report of the sampling results will be submitted to EPA within 2 weeks of receipt of the validated data.

EPA and WESTON START will begin the site assessment on Monday, July 8, 2013. The site assessment is expected to take approximately 1 to 2 weeks. Additional sampling may be requested by EPA once initial sampling results are reported by the labs.

5.0 Project Quality Objectives

5.1 Project Objectives

Sufficient data will be obtained from a representative number of samples to support defensible decisions by the EPA and to determine whether further actions at the site are necessary.

The following is a list of project objectives that may apply to the site investigation:

- To determine whether a vapor intrusion mitigation system installation is warranted in residential and commercial buildings in the vicinity of the Site and whether the response should be classified as an emergency, time-critical, or non-time-critical removal action.

- To rapidly assess and evaluate the urgency, magnitude, extent and impact of a release, or threatened release, of hazardous substances, pollutants or contaminants, and their impact on human health and/or the environment.

- To assess air quality to determine if residents or site personnel need to be evacuated.

- To supply the Agency for Toxic Substances and Disease Registry (ATSDR) or others with information about the nature and magnitude of any health threat and to support subsequent public health advisories.

- To determine a remedy to eliminate, reduce, or control risks to human health and the environment and to support an "Action" decision memorandum documenting the identified removal approach.

More information about the sampling procedures to support this is provided in Section 6.

5.2 Measurement and Performance Criteria

Generic measurement and performance criteria described in the *START III Generic QAPP* will be used. These criteria will ensure that data are sufficiently sensitive, precise, accurate, and representative to support site decisions.

5.3 Data Quality Objectives

Data quality objectives address requirements that include when, where, and how to collect samples; the number of samples; and the limits on tolerable error rates. These steps should periodically be revisited as new information about a problem is learned.

Refer to START III Generic QAPP, Figure 13.

When the analytical results from the air samples are received, the results will be compared with the PCE and TCE screening levels developed by the Ohio Department of Health (ODH) and

ATSDR. If the screening levels are exceeded, EPA will meet with ODH and the local health department to determine the appropriate mitigation measures. The following are the PCE and TCE sub-slab and indoor air screening levels for residential locations (see Attachment 2):

- Sub-Slab PCE screening level = 60 ppbv
- Indoor Air PCE screening level = 6 ppbv

- Sub-Slab TCE screening level = 4 ppbv
- Indoor Air TCE screening level = 0.4 ppbv

Groundwater results will be compared to the respective Maximum Contaminant Level (MCL) of PCE and TCE.

- PCE MCL = 5 parts per billion (ppb)
- TCE MCL = 5 ppb

6.0 Sampling Design

This section describes the sampling procedures, sample numbering system, and management of investigation-derived waste.

6.1 Sampling Procedures

Sampling will be initiated during the week of July 8, 2013. Groundwater samples will be collected by Ohio EPA's Site Investigation Field Unit (SIFU). Soil gas probes will be installed by Ohio EPA SIFU using a Geoprobe unit. Soil gas samples will be collected by START. The Geoprobe locations will be determined by Ohio EPA. The collection of each sample type is described below.

- **Groundwater Sampling.** At each Geoprobe location, Ohio EPA SIFU will advance the Geoprobe to a depth where groundwater is encountered. START will supply sample bottles to Ohio EPA. Ohio EPA will characterize the soil and collect a groundwater sample with a low flow sampling pump, if possible. Ohio EPA will have its mobile laboratory on site to analyze/screen all groundwater samples for VOCs with a Voyager unit.
- **Soil Gas Sampling**. Ohio EPA SIFU will install soil gas probes at a deep interval (just above groundwater) and at a shallow interval (about half the depth of the deep interval). Ohio EPA will collect a Tedlar bag air sample from each soil gas probe installed. The tedlar bag air sample will be analyzed/screened by the mobile laboratory for VOCs. START will review the mobile laboratory soil gas probe data. The soil gas probes showing elevated PCE concentrations will be targeted for soil gas sampling by START. START will collect the soil gas samples using a 1-L SUMMA canister attached to a 10-minute regulator. Approximately 9 soil gas samples will be

collected and analyzed by START. The soil gas probe locations are shown in **Figure 1**.

- **Sub-slab Sampling**. The sub-slab air samples will be collected in accordance with standard operating procedures for the construction and installation of permanent sub-slab soil gas wells (vapor probes) under the Response Engineering and Analytical Contract (see Attachment 1 for SOP# 2082). The sub-slab vapor probes will be installed in residential locations with basements with concrete floors or where the main floor was a concrete slab. All samples will be collected using pre-cleaned, laboratory-supplied, 6-liter SUMMA canisters. The SUMMA canisters will be fitted with regulators to allow for sample collection over a 24-hour period (residential) or an 8-hour period (non-residential, if necessary). SUMMA canisters will be connected to the vapor probes for sub-slab samples using Teflon tubing.
- **Indoor air sampling**. If requested by EPA, START will collect an indoor air sample at a residential or non-residential property. All samples will be collected using pre-cleaned, laboratory-supplied, 6-liter SUMMA canisters. The SUMMA canisters will be fitted with regulators to allow for sample collection over a 24-hour period (residential) or an 8-hr period (non-residential, if necessary). The indoor air sampling height will be approximately 3 feet off of the ground. If there is a dirt crawl space, START will attach approximately 3 feet of Teflon tubing to a wooden stick and place into the crawl space.

The sample container, volume, and preservation requirements are presented in **Table 2: Sampling and Analysis Summary.**

6.2 Sample Numbering System

All samples for analysis will be given a unique sample number. The sample numbers will be recorded in the field logbook, the COC paperwork, and the shipment documents.

START will assign each sample a project sample number. The project sample number highlights the suspected contaminated area and location, and will be used for documentation purposes in field logbooks, as well as for presentation of the analytical data in memoranda and reports. The project sample numbering system will be composed of the components below.

Project Identifier

The first part of the project sample numbering system will be the two-character designation VP. VP corresponds to Valley Pike Site.

Sample Type and Sequence Identifier

This shall consist of two characters identifying the type of sample being collected.

- SS refers to a sub-slab air sample
- IA refers to an indoor air sample
- SG refers to a soil gas sample from an installed soil gas probe

- GW refers to a groundwater sample

Sample Location

For the residential/commercial building sub-slab samples, this shall consist of the address where the sample is being performed.

- 2233RIVER refers to the sample collected at 2233 River Road.

For the soil gas probe sampling, this shall consist of the probe ID

- SG2 refers to soil gas location 2.

The depth of the soil gas probe will also be included.

- SG2-11 refers to a soil gas probe at location 2, set to 11 feet bgs

Should more than one sample be collected from the same address a one or two character sequence identifier will be added.

- SS1 refers to the first sub-slab air sample location collected at a single address location.

Sample Date

This shall consist of a six digit date (*i.e.*, 070813 for July 8, 2013).

Some examples of the START project sample numbering system are as follows:

- VP-120Hypathia-SS-070813: Valley Pike Site; sub-slab air sample collected at 120 Hypathia Avenue on July 8, 2013.

- VP-SG1-11-070813: Valley Pike Site; Soil gas sample from Gas Probe 1 location, from the 11-foot depth and collected on July 8, 2013.

6.3 Management of Investigation-Derived Wastes

For purposes of this FSP, investigation-derived wastes are defined as any byproduct of the field activities that is suspected or known to be contaminated with hazardous substances. The performance of field activities will produce waste products, such as spent sampling supplies (*e.g.*, tubing, foil pans, etc.), and expendable Personal Protective Equipment (PPE).

All investigation-derived wastes will be double-bagged and brought back to the Cincinnati office for disposal.

7.0 Sampling Procedures

7.1 Sampling Standard Operating Procedures

The following Standard Operating Procedures (SOPs) will be used during the site evaluation:

- SOP101 – Logbook Documentation
- SOP102 – Field Notes
- SOP103 – Chain-of-Custody Documentation
- SOP104 – Photographic and Video Documentation
- SOP301 – Decontamination Procedures
- EPA SOP #2042 – Soil Gas Sampling

7.2 Decontamination Procedures

General decontamination procedures are described in Section B.2 of the *START III Generic QAPP*.

Personal decontamination will consist of dry decontamination methods. Hand sanitizer will be available when PPE is doffed. All sampling equipment will be dedicated, thus no sampling equipment decontamination will be required.

8.0 Sample Handling, Tracking, and Custody Procedures

All samples will be identified, handled, shipped, tracked, and maintained under chain of custody, in accordance with the *START III Generic QAPP*.

9.0 Field Analytical Methods and Procedures

9.1 Field Analytical Methods and Standard Operating Procedures

There are no field analytical methods or SOPs associates with this sampling event.

9.2 Field Testing Laboratory

Ohio EPA will have a mobile laboratory on site with a Photovac Voyager gas chromatograph to screen groundwater, soil gas and sub-slab samples for VOCs.

9.3 Screening/Confirmatory Analyses

Ohio EPA will screen the groundwater, soil gas and sub-slab air samples using a Voyager gas chromatograph. Ohio EPA will also screen the soil gas samples using a MultiRAE Pro photoionization detector.

10.0 Fixed Laboratory Analytical Methods and Procedures

The following commercial laboratory will be utilized for sample analyses.

Air Samples

STAT Analysis Corp.
2242 W. Harrison St. Suite 200
Chicago, IL 60612
312-733-0551

Water Samples

ALS Environmental
4388 Glendale-Milford Road
Cincinnati, Ohio 45242
513-733-5336

11.0 Quality Control Activities

11.1 Field Quality Control

The number of QC samples collected for each analytical parameter and concentration level are listed in **Table 2: Sampling and Analysis Summary.** The QC sample determination and frequency is in accordance with the *START III Generic QAPP*, Table 4.

11.2 Analytical Quality Control

QC for analytical procedures will be performed at the frequency described in the *START III Generic QAPP*, Tables 5 and 6. In addition, method-specific QC requirements will be used to ensure data quality

11.3 Performance Evaluation Samples

There will not be Performance Evaluation samples analyzed for this project.

12.0 Documentation, Records, and Data Management

Documentation, record keeping, and data management activities will be conducted in accordance with the *START III Generic QAPP*, Section B.10.

13.0 Quality Assurance Assessment and Corrective Actions

No field audits will be conducted due to the short-term (two day) duration of the sampling event.

14.0 Reports to Management

Reports to management will be written and distributed in accordance with the *START III Generic QAPP,* Section C.

15.0 Steps 1, 2 and 3: Data Review Requirements and Procedures

Step 1: Data collection activities, including sample collection and data generation, will be verified in accordance with the *START III Generic QAPP*, Section D.

Step 2: Data will be validated by WESTON START.

Step 3: Data will be reviewed for usability in accordance with the *START III Generic QAPP*, Section D.

TABLES

Table 1
FSP Revision Form

Site: Valley Pike VOC
OSC: Steve Renninger
TDD: S05-0001-1305-005

Date	Revision Number	Proposed Change to FSP/QAPP	Reason for Change of Scope/Procedures	FSP Section Superseded	Requested By	Approved By

Table 2
Sampling and Analysis Summary

Site: Valley Pike VOC
OSC: Steve Renninger
TDD: S05-0001-1305-005

Matrix	Analytical Parameter	Analytical Method	Containers (Numbers, Size, and Type)	Preservation Requirements	Number of Sampling Locations	Number of Field Duplicates	Number of MS/ MSDs[2]	Number of Blanks (Trip, Field, Equip. Rinsate)[1]	Total Number of Samples to Lab[3]	Holding Time
Soil Gas	VOCs	TO-15	1-L summa canister	None	9	0	0	0	9	30 Days
Sub-Slab Air/Indoor Air	VOCs	TO-15	6-L Summa Canister	None	10	0	0	0	10	30 Days
Groundwater	VOCs	8260B	2x 40ml VOC vials	HCl	3-5	0	0	0	3-5	14 days

Notes:
[1] Trip blanks are only required for VOCs in water samples.
[2] For the samples designated for MS/MSDs, triple volume is required for VOCs and double volume for other water parameters.
[3] Total number of samples to the laboratory does not include MS/MSD samples.

Equip. – Equipment
HCl – Hydrochloric Acid
MS/MSD – Matrix Spike/Matrix Spike Duplicate
VOC – Volatile Organic Compound

FIGURES

OhioEPA

Mullins Rubber Products Inc.
Time-Critical Removal Action Assessment
Proposed Geoprobe Sampling Locations

May 3, 2013
JRW
Aerial Source: World Imagery
37 Degree Counter-clockwise Rotation

0 125 250 500
Feet

LEGEND/KEY

- Proposed TCR Assessment Geoprobe Boring Locations
- Shallow Aquifer Wells
- Mullins Rubber Products, Inc. Property Boundary

SC Soil Core
SG Soil Gas
SS Soil Sample
GW Groundwater grab

ATTACHMENT 1

REAC SOP #2082
FOR CONSTRUCTION AND INSTALLATION OF PERMANENT SUB-SLAB SOIL GAS WELLS

Response Engineering and Analytical Contract

STANDARD OPERATING PROCEDURES

CONSTRUCTION AND INSTALLATION OF PERMANENT SUB-SLAB SOIL GAS WELLS

CONTENTS

CONSTRUCTION AND INSTALLATION OF PERMANENT SUB-SLAB SOIL GAS WELLS

1.0 SCOPE AND APPLICATION

This standard operating procedure (SOP) outlines the procedure used for the construction and installation of permanent sub-slab soil gas wells. The wells are used to sample the gas contained in the interstitial spaces beneath the concrete floor slab of dwellings and other structures.

Soil gas monitoring provides a quick means of detecting volatile organic compounds (VOCs) in the soil subsurface. Using this method, underground VOC contamination can be identified and the source, extent and movement of pollutants can be traced.

2.0 METHOD SUMMARY

Using an electric Hammer Drill or Rotary Hammer, an inner or pilot hole is drilled into the concrete slab to a depth of approximately 2" with the ⅜" diameter drill bit. Using the pilot hole as the center, an outer hole is drilled to an approximate depth of 1⅜ " using the 1" diameter drill bit. The 1" diameter drill bit is then replaced with the ⅜" drill bit. The pilot hole is drilled through the slab and several inches into the sub-slab material. Once drilling is completed, a stainless steel probe is assembled and inserted into the pre-drilled hole. The probe is mounted flush with the surrounding slab so it will not interfere with pedestrian or vehicular traffic and cemented into place. A length of Teflon® tubing is attached to the probe assembly and to a sample container or system.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING AND STORAGE

3.1 SUMMA® Canister Sampling

After the sub-slab soil gas sample is collected, the canister valve is closed, an identification tag is attached to the canister and the canister is transported to a laboratory under chain of custody for analysis. Upon receipt at the laboratory, the data documented on the canister tag is recorded. Sample holding times are compound dependent, but most VOCs can be recovered from the canister under normal conditions near the original concentration for up to 30 days. Refer to REAC SOP #1704, *SUMMA Canister Sampling* for more details.

3.2 Tedlar® Bag Sampling

Tedlar® bags most commonly used for sampling have a 1-liter volume capacity. After sampling, the Tedlar® bags are stored in either a clean cooler or an opaque plastic bag at ambient temperature to prevent photodegradation. It is essential that sample analysis be undertaken within 24 to 48 hours following sample collection since VOCs may escape or become altered. Refer to REAC SOP #2102, *Tedlar® Bag Sampling* for more details.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

The thickness of a concrete slab may vary from structure to structure. A structure may also have a single slab where the thickness varies. A slab may contain steel reinforcement (REBAR). Drill bits of various sizes and cutting ability will be required to penetrate slabs of varying thicknesses or those that are steel-reinforced.

5.0 EQUIPMENT/APPARATUS

- Hammer Drill or Rotary Hammer
- Alternating current (AC) extension cord
- AC generator, if AC power is not available on site
- Hammer or Rotary Hammer drill bit, ⅜"diameter
- Hammer or Rotary Hammer drill bit, 1"diameter
- Portable vacuum cleaner
- 1 - ¾" open end wrench or 1-medium adjustable wrench
- 2 - 9/16" open end wrenches or 2-small adjustable wrenches
- Hex head wrench, ¼"
- Tubing cutter
- Disposable cups, 5 ounce (oz)
- Disposable mixing device (i.e., popsicle stick, tongue depressor, etc.)
- Swagelok® SS-400-7-4 Female Connector, ¼" National Pipe Thread (NPT) to ¼" Swagelok® connector
- Swagelok® SS-400-1-4 Male Connector, ¼"NPT to ¼" Swagelok® connector
- ¼" NPT flush mount hex socket plug, Teflon®-coated
- ¼" outer diameter (OD) stainless steel tubing, pre-cleaned, instrument grade
- ¼" OD Teflon® tubing
- Teflon® thread tape
- ⅛"OD stainless steel rod, 12" to 24" length
- Swagelok Tee, optional (SS-400-3-4TMT or SS-400-3-4TTM)

6.0 REAGENTS

- Tap water, for mixing anchoring cement
- Anchoring cement
- Modeling clay

7.0 PROCEDURES

7.1 Probe Assembly and Installation

1. Drill a ⅜" diameter inner or pilot hole to a depth of 2" (Figure 1, Appendix A).

2. Using the ⅜" pilot hole as your center, drill a 1" diameter outer hole to a depth of 1 ⅜". Vacuum out any cuttings from the hole (Figure 2, Appendix A).

3. Continue drilling the ⅜ inner or pilot hole through the slab and a few inches into the sub-slab material (Figure 3, Appendix A). Vacuum out any cuttings from the outer hole.

4. Determine the length of stainless steel tubing required to reach from the bottom of the outer hole, through the slab and into the open cavity below the slab. To avoid obstruction of the probe tube, ensure that it does not contact the sub-slab material. Using a tube cutter, cut the tubing to the desired length.

5. Attach the measured length (typically 12") of ¼" OD stainless tubing to the female connector (SS-400-7-4) with the Swagelok® nut. Tighten the nut.

6. Insert the ¼" hex socket plug into the female connector. Tighten the plug. **Do not over tighten**. If excessive force is required to remove the plug during the sample set up phase, the probe may break loose from the anchoring cement.

7. Place a small amount of modeling clay around the stainless steel tubing adjacent to the Swaglok® nut, which connects the stainless steel tubing to the female connector. Use a sufficient amount of modeling clay so that the completed probe, when placed in the outer hole, will create a seal between the outer hole and the inner hole. The clay seal will prevent any anchoring cement from flowing into the inner hole during the final step of probe installation.

8. Place the completed probe into the outer hole. The probe tubing should not contact the sub-slab material and the top of the female connector should be flush with the surface of the slab and centered in the outer hole (Figure 4, Appendix A). If the top of the completed probe is not flush with the surface of the slab, due to the outer hole depth being greater than 1 ⅜", additional modeling clay may be placed around the stainless steel tubing adjacent to the Swaglok® nut, which connects the stainless steel tubing to the female connector. Use a sufficient amount of clay to raise the probe until it is flush with the surface of the slab while ensuring that a portion of the clay will still contact and seal the inner hole.

9. Mix a small amount of the anchoring cement. Fill the space between the probe and the outside of the outer hole. Allow the cement to cure according to manufacturers instructions before sampling.

7.2 Sampling Set-Up

1. Wrap one layer of Teflon® thread tape onto the NPT end of the male connector (SS-400-1-4). Refer to Figure 5, Appendix A.

2. Remove the ¼" hex socket plug from the female connector (SS-400-7-4). Refer to Section 7.3 if the probe breaks loose from the anchoring cement during this step.

3. To ensure that the well has not been blocked by the collapse of the inner hole below the end of the stainless steel tubing, a stainless steel rod, ⅛"diameter, may be passed through the female connector and the stainless steel tubing. The rod should pass freely to a depth greater than the length of the stainless steel tubing, indicating an open space or loosely packed soil below the end of the stainless steel tubing. Either condition should allow a soil gas sample to be collected.

   If the well appears blocked, the stainless steel rod may be used as a ramrod in an attempt to open the well. If the well cannot be opened, the probe should be reinstalled or a new probe installed in an alternate location.

4. Screw and tighten the male connector (SS-400-1-4) into the female connector (SS-400-7-4). **Do not over tighten**. This may cause the probe to break loose from the anchoring cement during this step or when the male connector is removed upon completion of the sampling event. Refer to Section 7.3 if the probe breaks loose from the anchoring cement during this step.

5. If a collocated sub-slab sample or split sample is desired, a stainless steel Swagelok Tee (SS-400-3-4TMT or SS-400-3-4TTM) may be used in place of the Swagelok male connector (SS-400-1-4).

6. Attach a length of ¼"OD Teflon® tubing to the male connector with a Swagelok® nut. The Teflon® tubing is then connected to the sampling container or system to be used for sample collection.

7. After sample collection remove the male connector from the probe and reinstall the hex socket plug. **Do not over tighten** the hex socket plug. If excessive force is required to remove the plug during the next sampling event the probe may break loose from the

anchoring cement. Refer to Section 7.3 if the probe breaks loose from the anchoring cement during this step.

7.3 Repairing a Loose Probe

1. If the probe breaks loose from the anchoring cement while removing or installing the hex head plug or the male connector (SS-400-1-4), lift the probe slightly above the surface of the concrete slab.

2. Hold the female connector (SS-400-7-4) with the ¾" open end wrench.

3. Complete the step being taken during which the probe broke loose, following the instructions contained in this SOP (i.e., **Do not over tighten** the hex socket plug or male connector).

4. Push the probe back down into place and reapply the anchoring cement.

5. Modeling clay may be used as a temporary patch to effect a seal around the probe until the anchoring cement can be reapplied.

8.0 CALCULATIONS

This section is not applicable to this SOP.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

An additional collocated soil gas well is installed with the frequency of 10 percent (%) or as specified in the site-specific Quality Assurance Project Plan (QAPP). The following general Quality Assurance (QA) procedures apply:

1. A rough sketch of the area is drawn where the ports are installed with the major areas noted on the sketch. This information may be transferred to graphing software for incorporation into the final deliverable.

2. A global positioning system (GPS) unit may be used to document coordinates outside of a structure as a reference point.

3. Equipment used for the installation of sampling ports should be cleaned by heating, inspected and tested prior to deployment.

10.0 DATA VALIDATION

This section is not applicable to this SOP.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA) and Lockheed Martin corporate health and safety procedures. All site activities should be documented in the site-specific health and safety plan (HASP).

12.0 REFERENCES

This section is not applicable to this SOP.

13.0 APPENDICES

A - Figures

APPENDIX A
Soil Gas Installation Figures
SOP #2082
March 2007

FIGURE 1

INNER or PILOT HOLE

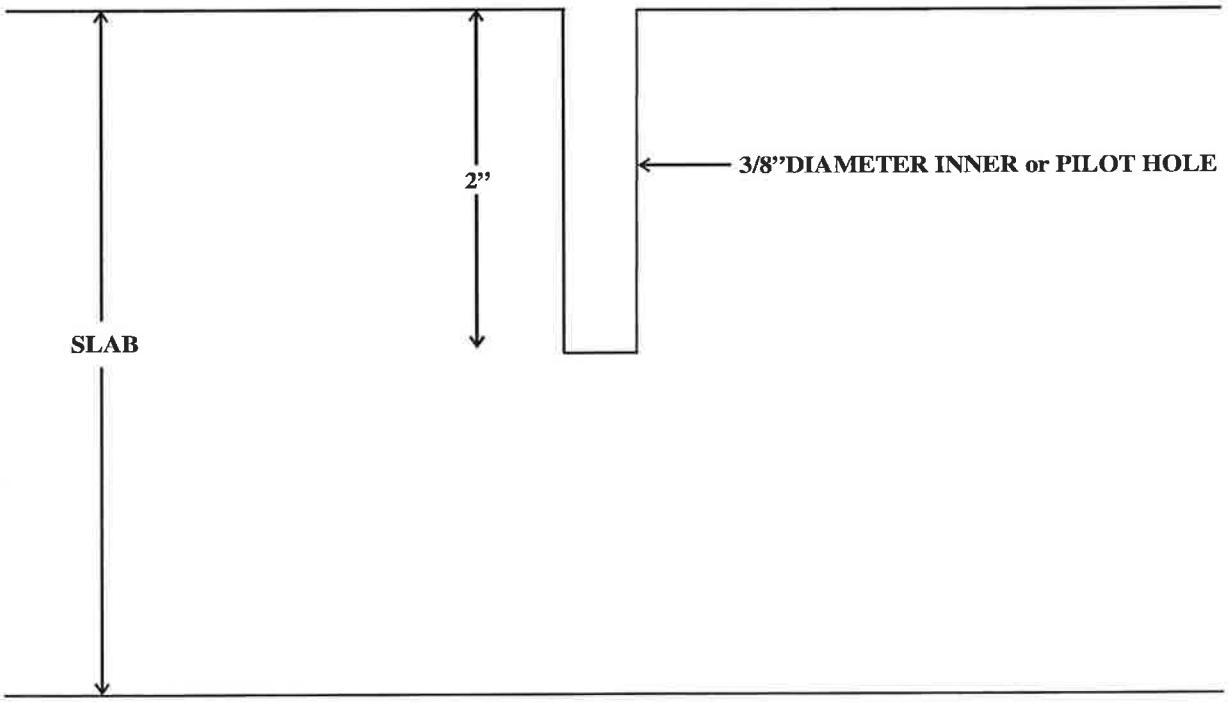


FIGURE 2

OUTER HOLE

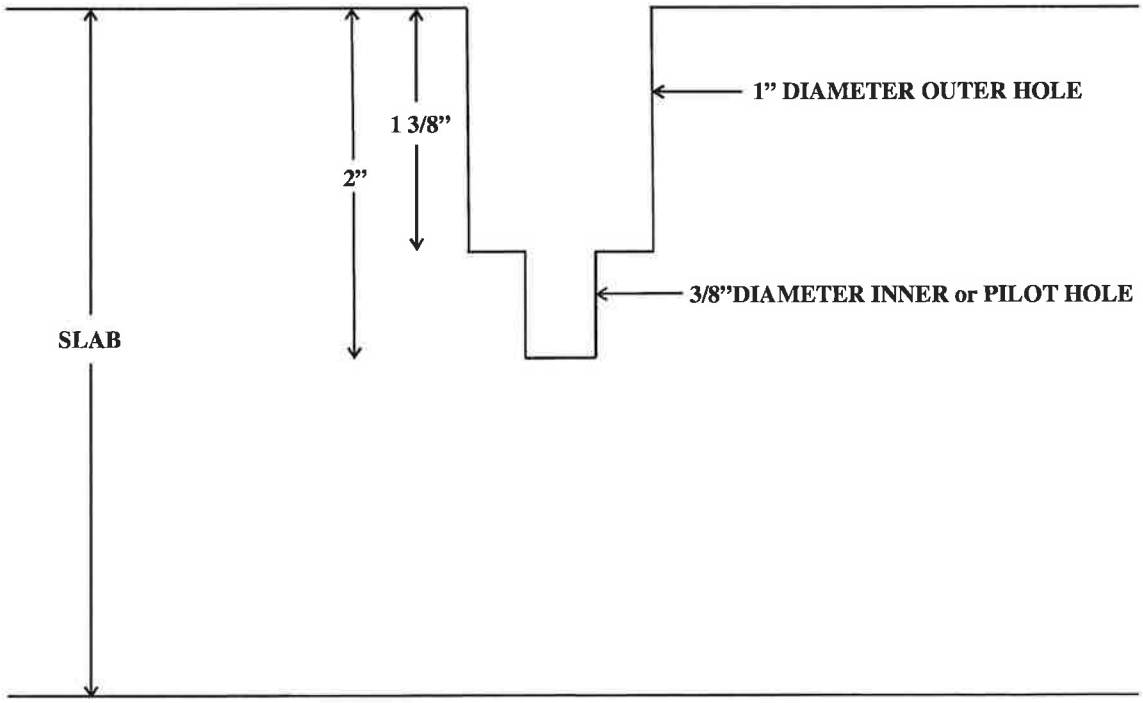


FIGURE 3

COMPLETED HOLE PRIOR to PROBE INSTALLATION

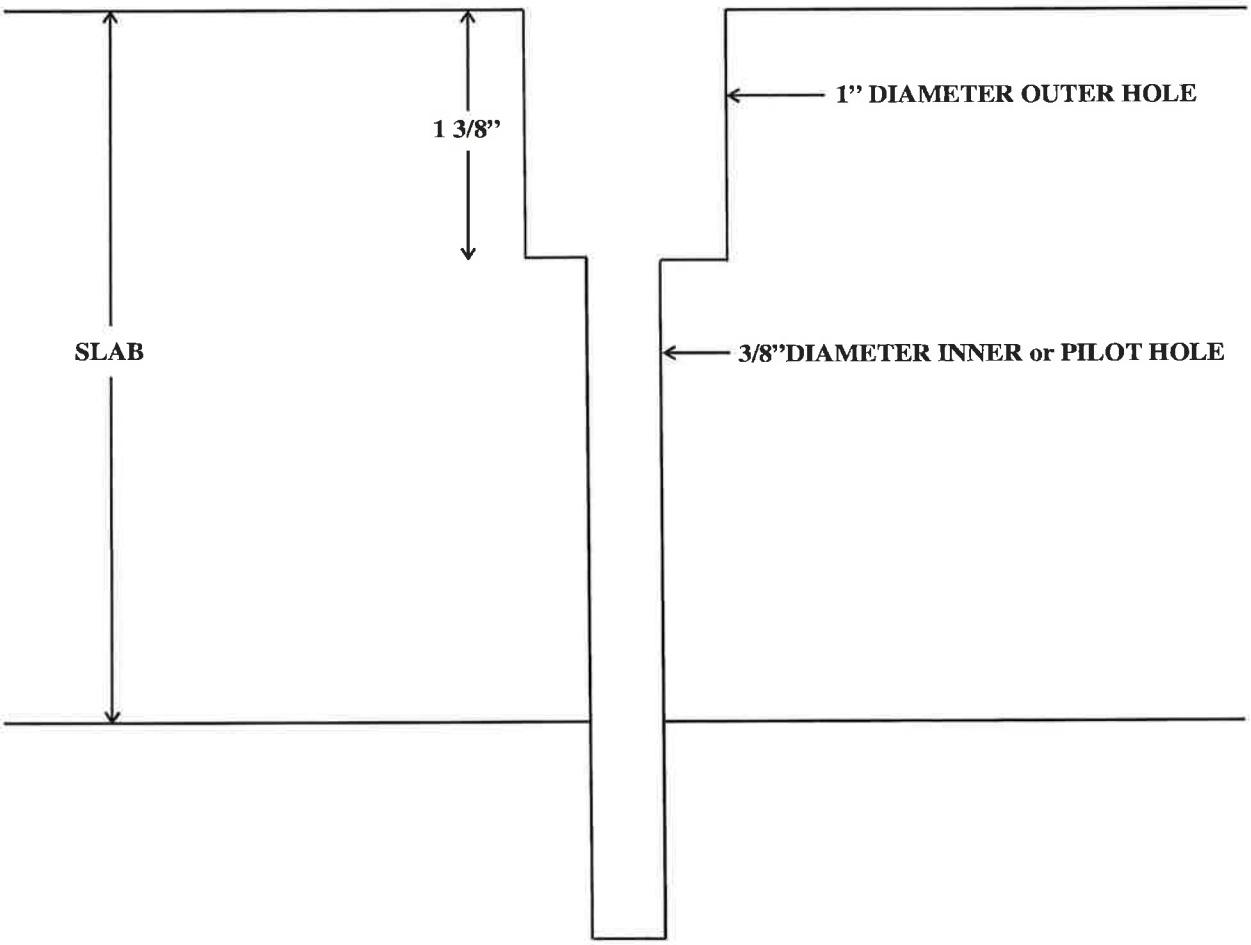


FIGURE 4

SOIL GAS PROBE INSTALLED

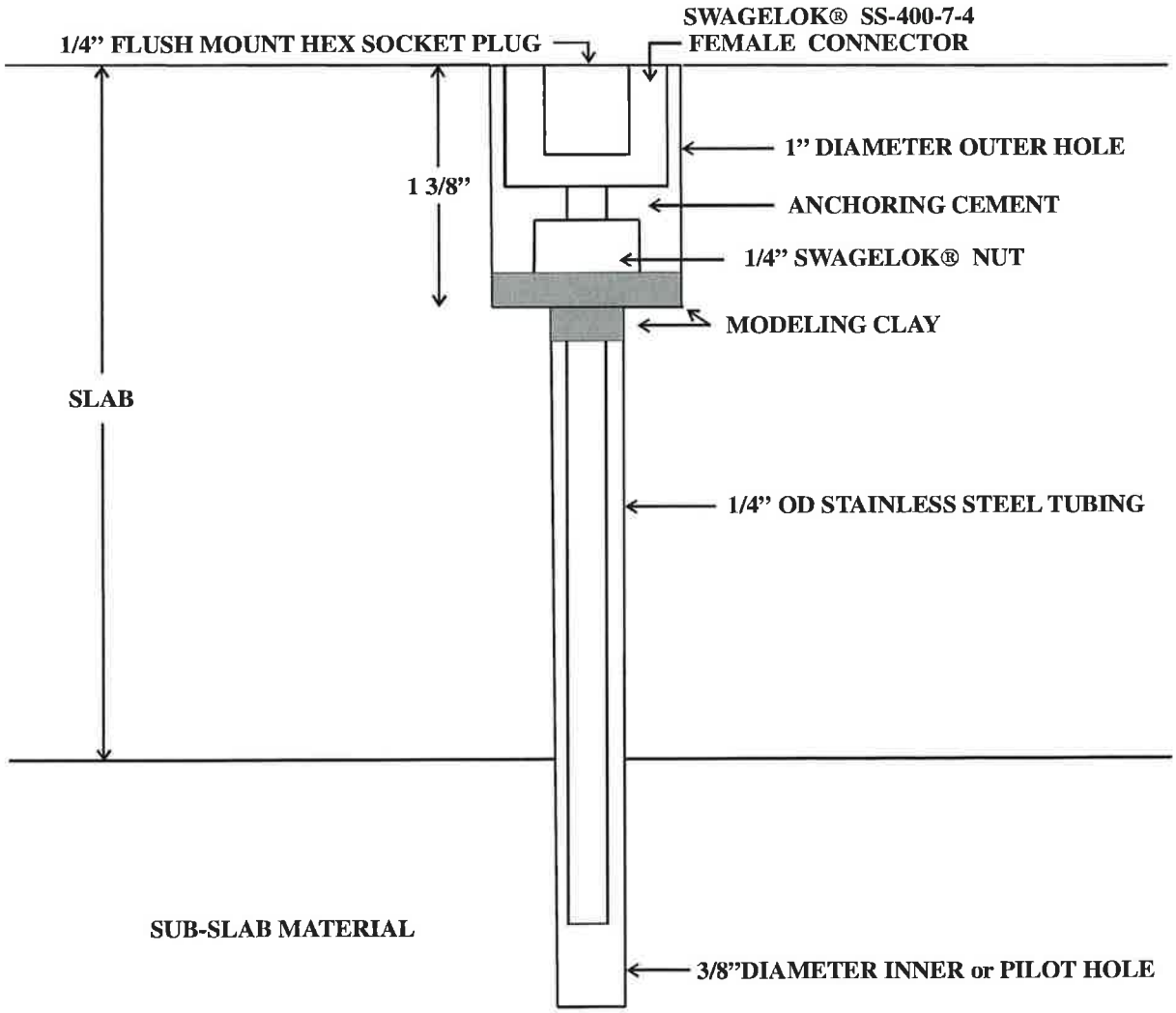
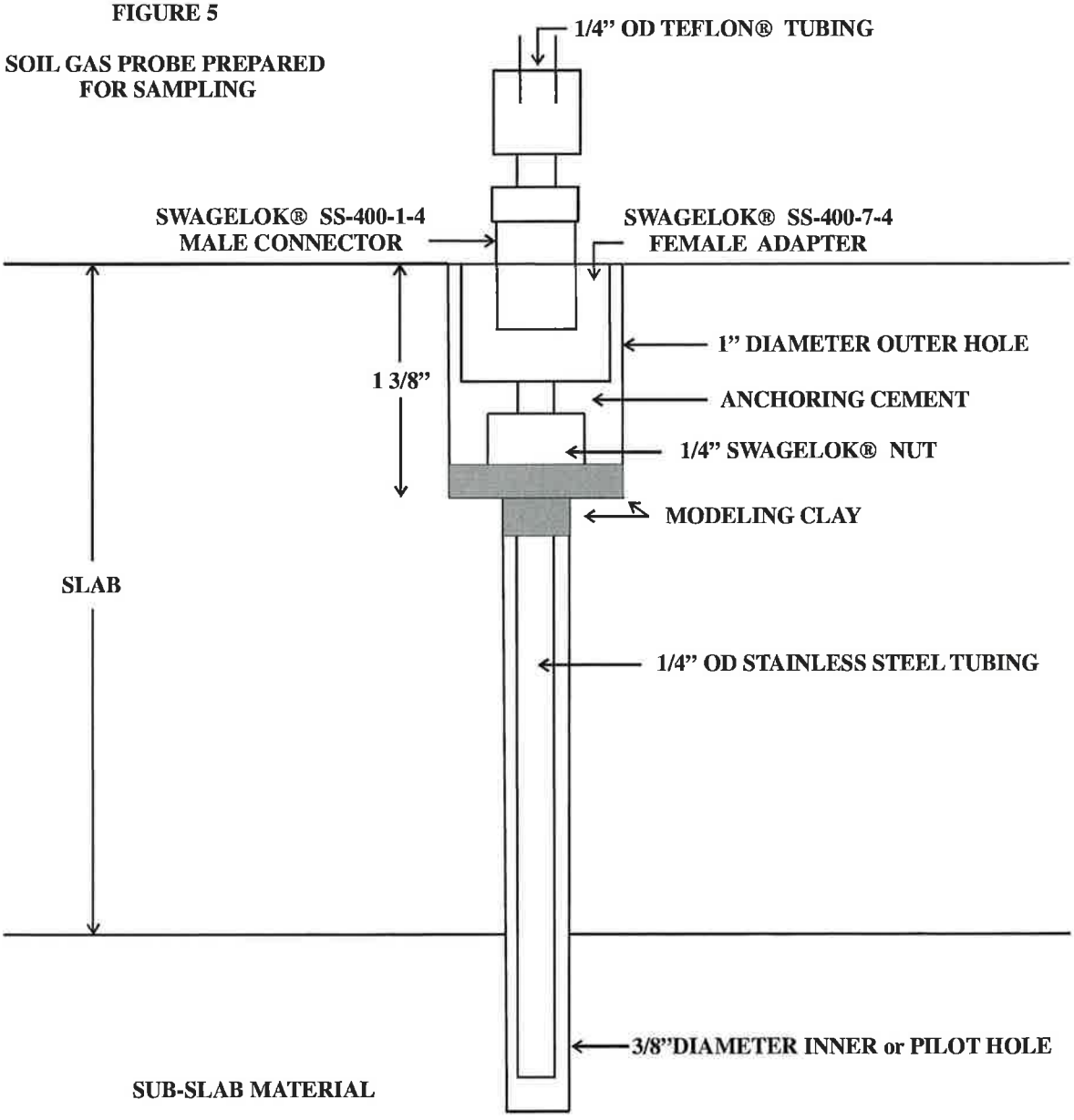


FIGURE 5

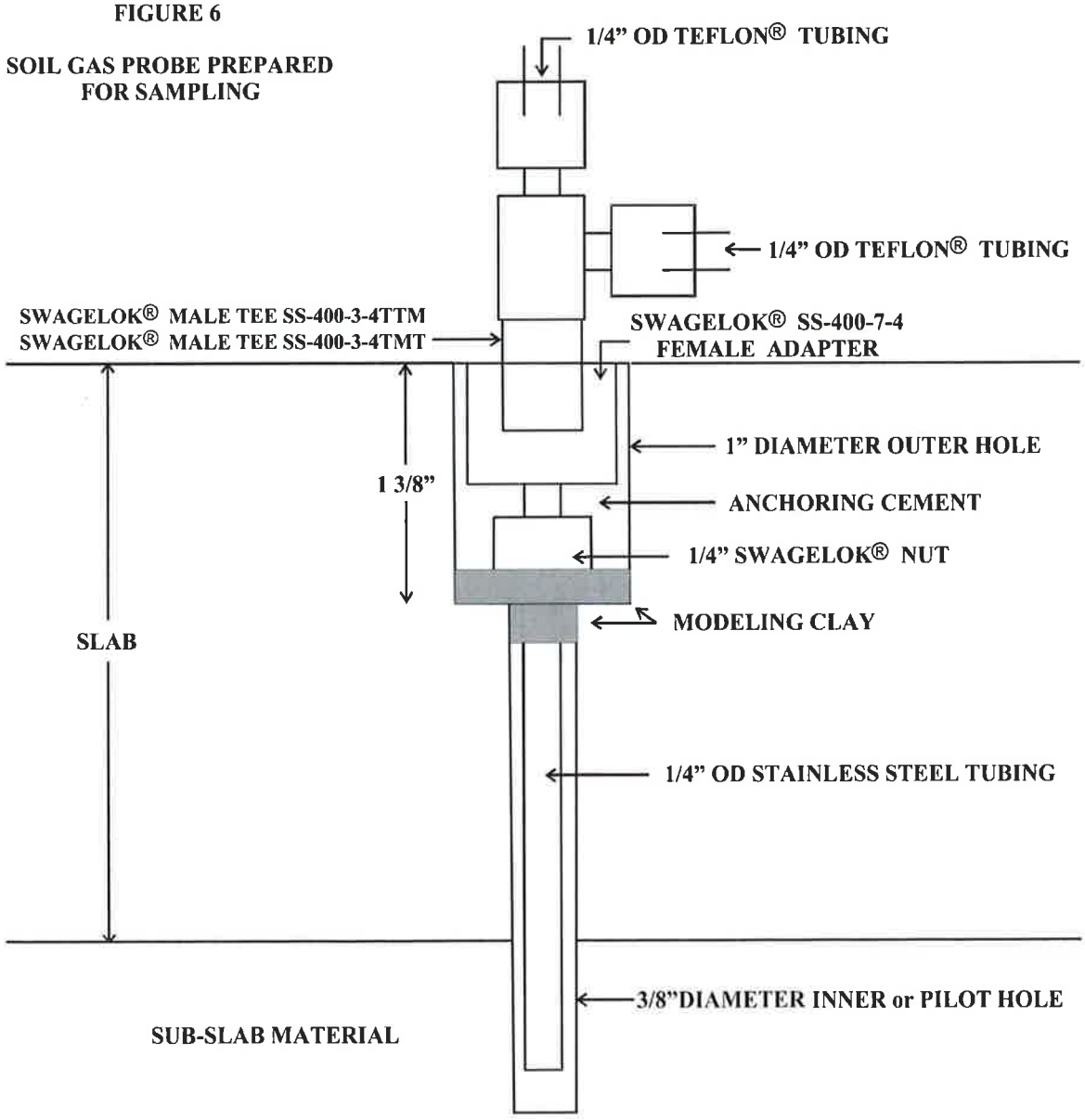
SOIL GAS PROBE PREPARED FOR SAMPLING



CONSTRUCTION AND INSTALLATION OF PERMANENT SUB-SLAB SOIL GAS WELLS

FIGURE 6

SOIL GAS PROBE PREPARED FOR SAMPLING



ATTACHMENT 2

OHIO DEPARTMENT OF HEALTH
SITE-SPECIFIC SCREENING LEVELS

OHIO DEPARTMENT OF HEALTH

246 North High Street
Columbus, Ohio 43215

614/466-3543
www.odh.ohio.gov

John R. Kasich / Governor

Theodore E. Wymyslo, M.D. / Director of Health

June 14, 2013

Steven Renninger, On-Scene Coordinator
U.S. Environmental Protection Agency
Emergency Response Branch
26 West Martin Luther King Drive (G41)
Cincinnati, OH 45268

Dear Steve:

The Health Assessment Section of the Ohio Department of Health is providing screening levels and action levels for the contaminants of concern in indoor air and sub-slab soil gas for properties at the Valley Pike VOC site (aka Mullins Rubber Products, Inc. site), Riverside, Montgomery County, Ohio.

The values listed in the tables are expressed in micrograms per cubic meter ($\mu g/m^3$) and parts per billion (ppb). We prefer the use of ppb, as we believe it is more easily understood by the general public. Based on the Region 5 vapor intrusion guidance, we are giving you both screening levels and action levels for assessing vapor intrusion sites:

Screening Levels are based on 10^{-5} cancer risk or hazard index of 1.0. Screening levels represent concentrations of a substance that are unlikely to cause harmful (adverse) health effects in exposed people. Detections in indoor air below these levels are not of a health concern.

Action Levels are based on 10^{-4} cancer risk and hazard index of 10. Detections in indoor air that exceed this level would lead to a recommendation for actions to reduce exposure in a relatively short period of time.

Also included are corresponding values for non-residential buildings – spaces that are not used for residences or where children are not continuously present. Non-residential buildings include commercial businesses and public buildings, churches, non-manufacturing businesses, and industries where these chemicals are not used as part of the manufacturing process. The non-residential screening levels were derived by adjusting the residential values by a factor of 4.2 to adjust from a 168-hour week for the residential exposure to a 40-hour work week for the non-residential exposure. The sub-slab soil gas levels were derived by adjusting the indoor air values using an attenuation factor of 0.1. For industrial settings were the chemicals in question are used, OSHA permissible exposure limits or other occupational exposure values would apply.

If you have any questions regarding these values, please contact John Kollman in my program at (614) 752-8335.

Thank you.

Sincerely,

Robert Frey, PhD
Chief, Health Assessment Section, Ohio Department of Health

RF/jk

Table 1. Screening and Action Levels – Valley Pike VOC site, Ohio

Chemical of Concern	*Residential*		*Source*	*Non-residential*		*Source*
	µg/m³	*ppb*		*µg/m³*	*ppb*	
Screening Levels *Indoor Air*						
PCE	40	6	RfC	170	25	RfC x 4.2
TCE	2	0.4	RfC	10	2	RfC x 4.2
Sub-slab Soil Gas						
PCE	400	60	RfC x 10	1,700	250	RfC x 10 x 4.2
TCE	20	4	RfC x 10	100	20	RfC x 10 x 4.2
Action Levels *Indoor Air*						
PCE	400	60	RfC x 10	1,700	250	RfC x 10 x 4.2
TCE	20	4	RfC x 10	100	20	RfC x 10 x 4.2
Sub-slab Soil Gas						
PCE	4,000	600	RfC x 10 x 10	17,000	2,500	RfC x 10 x 10 x 4.2
TCE	200	40	RfC x 10 x 10	1,000	200	RfC x 10 x 10 x 4.2

PCE = tetrachloroethylene
TCE = trichloroethylene
$\mu g/m^3$ = micrograms per cubic meter
ppb = parts per billion
RfC = reference concentration (EPA)